

WHAT IS CLAIMED IS:

1. A method to inhibit or prevent infectious agent transmission in a mammalian transplant recipient, comprising:
- 5 a) introducing to donor swine cells a recombinant DNA comprising a promoter operably linked to a DNA segment encoding a protein comprising at least a portion of a polypeptide of the infectious agent that is present in the extracellular form of the agent so as to yield transformed swine cells; and
- 10 b) introducing the transformed swine cells to the recipient.
2. A method to inhibit or prevent infectious agent transmission in a mammalian transplant recipient, comprising:
- 15 a) introducing to donor human blood cells a recombinant DNA comprising a promoter operably linked to a DNA segment encoding a protein comprising at least a portion of a polypeptide of the infectious agent that is present in the extracellular form of the agent so as to yield transformed human blood cells; and
- 20 b) introducing the transformed human blood cells to the recipient.
3. A method to inhibit or prevent infectious agent transmission to a mammalian transplant recipient, comprising:
- 25 a) introducing to a donor organ a recombinant DNA comprising a promoter operably linked to a DNA segment encoding a protein comprising at least a portion of a polypeptide of the infectious agent that is present in the extracellular form of the agent so as to yield a transformed organ; and
- 30 b) introducing the transformed organ to the recipient.
4. The method of claim 1, 2 or 3 wherein the DNA segment encodes a fusion protein comprising at least a portion of a polypeptide of the infectious agent that is present in the extracellular form of the agent and a degradative enzyme.

5. The method of claim 4 wherein the degradative enzyme is a nuclease or protease.
6. The method of claim 1, 2 or 3 wherein the infectious agent is a virus.
7. The method of claim 6 wherein the polypeptide of the infectious agent is a viral capsid protein, viral glycoprotein or an accessory protein.
8. The method of claim 6 wherein the virus is a lentivirus, retrovirus, hepatitis virus or a herpesvirus.
9. The method of claim 1 wherein the donor cells are embryonic stem cells, blood cells, neuronal cells, liver cells, pancreatic cells, kidney cells or islet cells.
10. The method of claim 3 wherein the organ is a heart, liver or kidney.
11. The method of claim 3 wherein the organ is a human or pig organ.
12. The method of claim 4 wherein the DNA segment encodes a fusion protein encoding a polypeptide of a pig endogenous retrovirus.
13. The method of claim 5 wherein the enzyme is barnase, staphylococcal nuclease, RNase H1, RNase T1, retroviral protease, RNase III, RNaseL, or a ribozyme.
14. The method of claim 7 wherein the polypeptide of the infectious agent is Vpr, Vpx, Vif or Nef.
15. An isolated and purified nucleic acid molecule comprising a nucleic acid segment which comprises at least a portion of a pig endogenous retrovirus, wherein the nucleic acid segment hybridizes under hybridizing

conditions to SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, or SEQ ID NO:32.

- 5 16. An isolated and purified polypeptide encoded by a nucleic acid molecule comprising a nucleic acid segment comprising SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, or SEQ ID NO:32.
- 10 17. A method to detect human tropic pig endogenous retroviruses, comprising:
- 15 a) contacting a mammalian sample suspected of being infected with a pig endogenous retrovirus with a probe comprising at least a portion of SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, or SEQ ID NO:32 so as to form complexes; and
- b) detecting or determining the presence of the complexes.
- 20 18. A method of using an isolated and purified nucleic acid molecule comprising the genome of a pig endogenous retrovirus comprising: introducing to a host cell a recombinant DNA molecule comprising a promoter operably linked to a DNA segment comprising SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, or SEQ ID NO:32 so as to yield a transformed host cell, and identifying the transformed host cell.
- 25 19. The method of claim 1, 2, 3 or 18 wherein the recombinant DNA molecule further comprises transcriptional termination sequences 3' to the DNA segment.
- 30 20. A host cell, the genome of which is augmented with a recombinant DNA molecule comprising a promoter operably linked to a DNA segment encoding a fusion protein comprising at least a portion of a polypeptide of a pig endogenous retrovirus and a degradative enzyme.

21. A fusion protein, comprising: a capsid or envelope protein of a porcine endogenous virus and a degradative enzyme.
22. The fusion protein of claim 21 wherein the enzyme is a nuclease.
23. The fusion protein of claim 21 wherein the enzyme is a protease.
24. The fusion protein of claim 21 wherein the enzyme is a lipase.
25. The fusion protein of claim 21 wherein the activity of said enzyme is calcium-dependent.
26. The fusion protein of claim 25 wherein the enzyme is staphylococcal nuclease.
27. An isolated and purified DNA molecule encoding the fusion protein of claim 21.
28. A recombinant virus comprising a nucleic acid molecule encoding the fusion protein of claim 21.
29. An antibody that specifically binds pig endogenous retrovirus.
30. The antibody of claim 29 which binds a viral capsid protein.
31. The antibody of claim 29 which binds the viral envelope glycoprotein.
32. The method of claim 8 wherein the virus is Epstein Barr virus.
33. The method of claim 8 wherein the virus is cytomegalovirus.
34. The method of claim 8 wherein the virus is human immunodeficiency virus.

35. The method of claim 1, 2, 3 or 18 wherein the recombinant DNA is introduced to the recipient by infection with a recombinant virus.

5 36. A method to inhibit or prevent infectious agent transmission in a mammalian transplant recipient, comprising:

- 10 a) introducing to donor mammalian cells a recombinant DNA comprising a promoter operably linked to a DNA segment encoding a protein comprising at least a portion of a polypeptide of the infectious agent that is present in the extracellular form of the agent so as to yield transformed mammalian cells; and
- b) introducing the transformed mammalian cells to the recipient.

37. A method to inhibit or prevent infectious agent transmission in a mammalian transplant recipient, comprising:

- 15 a) introducing to donor human cells a recombinant DNA encoding a protein comprising at least a portion of a polypeptide of the infectious agent that is present in the extracellular form of the agent so as to yield transformed human cells; and
- b) introducing the transformed human cells to the recipient.

20

38. The method of claim 36 or 37 wherein the infectious agent is a virus.

39. The method of claim 38 wherein the polypeptide of the infectious agent is a viral capsid protein, viral glycoprotein or an accessory protein.

25

*Ar. 1*